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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,067	11/26/2003	Naoshi Matsuo	000538A	7810
23850	7590	10/26/2005	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP			PENDLETON, BRIAN T	
1725 K STREET, NW			ART UNIT	PAPER NUMBER
SUITE 1000				
WASHINGTON, DC 20006			2644	

DATE MAILED: 10/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/721,067	MATSUO, NAOSHI
	Examiner	Art Unit
	Brian T. Pendleton	2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 03 March 2005.
- 2a) This action is **FINAL**.                                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 26 November 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. 09/560,355.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 3/3/05 have been fully considered but they are not persuasive. Applicant asserts that Hatae does not calculate a directional sound signal to an arbitrary direction. Examiner maintains that either the signal output from subtractor 9 or adder 10 represents part of the directional sound signal based on the unidirectional received sound signal and the bidirectional sound signal, in one embodiment. In the prior art figure, circuit elements 3, 5, 22, and 23 calculate a directional sound signal.

Applicant's arguments, see page 9 of the paper, filed 3/3/05, with respect to claims 1, 5, 9, and 10 have been fully considered and are persuasive. The rejection of the claims under 35 U.S.C. 102 as anticipated by Chu et al and Huang et al has been withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 5, 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hatae. Hatae discloses a microphone apparatus and method comprising unidirectional microphone 1 (M) and bidirectional microphone 2 (S), and directional sound signal calculating function comprising inverter 3, adder 5, adder 22, and subtractor 23. Claims 5 and 10 are met.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatae in view of Chu et al. Hatae discloses a microphone apparatus comprising unidirectional microphone 1 (M), bidirectional microphone 2 (S), and a directional sound signal calculating function having inverter 3, adder 5, adder 22 and subtractor 23. Hatae discloses one unidirectional microphone but does not disclose that the microphone apparatus consists of only three unidirectional microphones, as the bidirectional signal is produced by a bidirectional microphone 2. Chu et al disclose a microphone system comprising a plurality of unidirectional microphones M<sub>A</sub>, M<sub>B</sub>, M<sub>C</sub>, M<sub>D</sub>. As taught in column 3 lines 52-66, taking the difference of two opposed pair of unidirectional microphones yields a bidirectional signal pattern (see figure 4 also). Thus, it was known to use two unidirectional microphones for one bidirectional microphone. As a result, it would have been obvious to one of ordinary skill in the art at the time of invention to use two unidirectional microphone elements (as microphones 2R, 2L) in the apparatus of Hatae for the purpose of generating a stereo microphone signal with precise microphone elements.

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatae in view of Chu, as applied to claim 1 above, and further in view of Chang. The combination of Hatae and Chu does not disclose a sound source direction detecting function for determining the direction of a sound source using a power in each axis direction of a sound signal calculated by the directional sound signal calculating function and a cross-correlation thereof. Chang et al disclose a microphone array for a video conference system that determines the position of a speaker using microphones 107L, 107R, 107C and 107R. As shown in figures 3 and 5 and

taught in column 4 lines 20-62, sound signals along axes are used to determine the location of a sound source by taking the power of the signals in each axis and doing a cross correlation. The benefit of this feature was to accurately determine the location of a conference participant and control the cameras 104L and 104R to point in his/her direction. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the sound source determination method taught by Chang in the combination microphone system of Hatae and Chu for the purpose of realizing a videoconference system with a wide stereo microphone pick-up area. Claim 2 is met. As to claim 3, Chu discloses that the control circuitry analyzes the microphone signals to determine the direction of the sound source and adjusts proportions of the mixing circuitry to direct its maximum response in the direction of the sound source. Therefore, it was well known to steer a microphone array in the direction of a determined sound source in order to enhance the voice of the speaker. It would have been obvious to one of ordinary skill in the art at the time of invention to do so in the combination of Hatae, Chu and Chang for the purpose of generating a microphone signal coincident with the speaker. Per claim 4, Chang discloses that the video camera is moved to capture the image of the talker.

Claim 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatae in view of Chang. Hatae does not disclose a sound source direction detecting function for determining the direction of a sound source using a power in each axis direction of a sound signal calculated by the directional sound signal calculating function and a cross-correlation thereof. Chang et al disclose a microphone array for a video conference system that determines the position of a speaker using microphones 107L, 107R, 107C and 107R. As shown in figures 3 and 5 and taught in column 4 lines 20-62, sound signals along axes are used to determine the location of a

sound source by taking the power of the signals in each axis and doing a cross correlation. The benefit of this feature was to accurately determine the location of a conference participant and control the cameras 104L and 104R to point in his/her direction. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the sound source determination method taught by Chang with the microphone system of Hatae for the purpose of realizing a videoconference system with a wide stereo microphone pick-up area. Claim 6 is met. As to claim 7, Official Notice is taken that it was common knowledge to one of ordinary skill in the art to use time delay estimation calculations to determine the location of a speaker during conferencing and steer the microphone array in the direction of the speaker for the benefit of enhancing the voice of the speaker. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Hatae and Chang to use this known technique to robustly track a speaker. As to claim 8, Chang discloses that the video camera is moved to capture the image of the talker.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Brandstein et al, US Patent 6,243,471.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (571) 272-7527. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian T. Pendleton  
Primary Examiner  
Art Unit 2644



btp